



Community Window on the Hunters Point Shipyard

PARCEL E LANDFILL BACKGROUND BOOKLET JUNE 2003

SUMMARY

Parcel E (located along the southern border of the Hunters Point Shipyard) is considered by many to be the most contaminated section of the Shipyard. For nearly 20 years, the portion of Parcel E known as the Industrial Landfill served as the Shipyard dump for wastes ranging from construction debris to low-level radioactive waste.

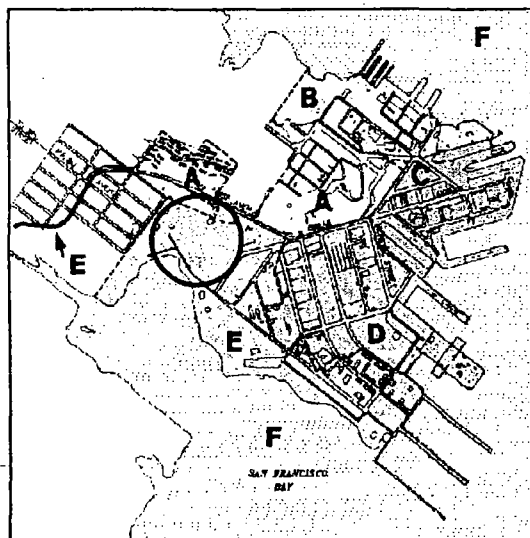
Although the Navy has spent millions of dollars so far to decrease the amount of contamination released from the Industrial Landfill, the Bayview Hunters Point community worries about the potential effects of the landfill on the health of the surrounding Bay and neighboring community. For example, the Navy still has not identified the actual contents of the Industrial Landfill. There are unanswered questions whether radioactive waste from the Naval Radiological Defense Laboratory (more dangerous than the known low level radioactive wastes) was dumped into the landfill. Residents have concerns that contamination in the ground-water and on the surface of the landfill is polluting the Bay. They also worry that gases that blew over the community during the fire that occurred on the landfill in 2000 contained toxic chemicals.

To help the community pursue their concerns about this site, this booklet summarizes all that is known to date about the Industrial Landfill on Parcel E. Keep in mind that the final cleanup decisions for Parcel E have not been made and new information may be available since the time this booklet was written. In-

formation can be found at the end of the booklet about how you can learn more and participate in the cleanup of the Shipyard.

GENERAL LANDFILL HISTORY

The Navy began filling in the shoreline along the southwest corner of Parcel E in 1942. Artificial fill, which consisted primarily of crushed serpentinite rock, was used to fill in the east and west sides of the site in the '40s and '50s. The remaining inlet that was filled between 1958 and 1974 is called the Industrial Landfill and covers approximately 46 acres. The depth of fill ranges from 2-32 feet below the ground surface. For the remainder of this booklet, the Industrial Landfill is referred to as the "Landfill".



Map of Hunters Point Shipyard highlighting the Industrial Landfill area on Parcel E

It is important to remember that the Landfill on Parcel E was constructed before environmental laws were passed that place restrictions and requirements on how landfills are built. Therefore, unlike landfills that are created today, the Parcel E Landfill lacks certain features of a modern landfill — most importantly

a clay liner, as well as permanent monitoring for leaching of contaminants to the groundwater, and permanent air monitoring. As a result, in many areas, the waste may be in direct contact with the native Bay sediments and the Bay.

Currently, the majority of the Landfill is unpaved and covered with seasonal vegetation and there are no buildings. The Parcel E shoreline is covered with riprap (large rocks) and rubble (such as broken concrete and bricks).

CONTAMINATION WITHIN THE LANDFILL

During the 16 years that the Landfill was in use, approximately 20 acres of the Bay were filled. The filling history is not well documented. In the Initial Assessment Study of the Shipyard conducted in 1984, the Navy estimated that 1 million cubic yards of solid material were disposed of in the Landfill. This included sandblast waste, asbestos-containing material, construction waste, domestic refuse, low-level radioactive wastes from shipboard radium dials and electronics equipment, as well as paint sludge, solvents and waste oils.

Known Soil and Groundwater Contaminants Found within the Landfill

- ⇒ Heavy metals: lead, chromium, copper, manganese
- ⇒ Volatile and semi-volatile organic compounds: e.g., tetrachloroethene, benzene, vinyl chloride and naphthalene
- ⇒ Pesticides
- ⇒ Polychlorinated biphenyls (PCBs)
- ⇒ Petroleum hydrocarbons
- ⇒ Chlorine gas

For more information about these chemicals, including easy to understand definitions, how you can be exposed and possible health effects, visit the Agency for Toxic Substances Disease Registry website at www.atsdr.cdc.gov/toxfaq.html

From May 1976 to June 1986, Triple A Machine Shop Inc., operated a commercial ship repair facility on the Shipyard. For the duration of their 10-year lease, Triple A subleased portions of Hunters Point Shipyard (HPS) to warehouse, industrial, and commercial firms. The San Francisco District Attorney's Office charged Triple A with illegally disposing of hazardous wastes at 19 locations throughout HPS; 15 of the locations were in Parcel E. Triple A reportedly disposed of industrial debris, sandblast waste, oily industrial sand and asphalt over 5 acres along the shoreline of Parcel E. Unlabeled, deteriorating, uncovered drums were also stored by Triple A in the southeast corner of Parcel E. These drums have been removed.

It should also be noted that there were many radiation testing labs at the Shipyard. There is no record of where the construction waste was disposed of after the labs were demolished, nor of where the animals that were used in the testing were disposed of. Some speculate that they were dumped in the Landfill area, though this has not yet been proven.

Soil cores taken from the debris zone show a wide array

of wastes, including paper, cardboard, Styrofoam, glass, cloth, plastic, rubber, wood debris with a creosote odor, sawdust, asphalt, concrete, brick, copper wire, nails, steel, brass and possible asbestos-containing material, and sandblast waste. Laboratory tests on soil taken from the Landfill area show the presence of heavy metals, such as lead, chromium, copper and manganese, semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and petroleum hydrocarbons.

The groundwater contaminants that have been detected within the Landfill are similar to the contaminants found in the soil, including metals, benzene, volatile and semi-volatile organic compounds (e.g., tetrachloroethene, vinyl chloride and naphthalene), pesticides, PCBs, and petroleum hydrocarbons. Floating product—an oily, petroleum-based waste floating on the surface of the groundwater—was found in the northern corner of the Landfill in March of 1992.

Soil gas surveys have found methane gas, petroleum hydrocarbons, chlorinated solvents, as well as volatile organic compound gases, like vinyl chloride. An unknown source of chlorine gas also exists within the Landfill (pressurized tanks are the prime suspect). More details about the latest landfill gas results as well as the removal action that is currently underway are provided in the section on landfill gas below.

EARTHEN DIKE

Since the Navy stopped using the Landfill in 1974, some action has been taken to reduce the flow of contamination into the San Francisco Bay. Between 1974 and 1975, a drainage system was installed to redirect storm water away from the Landfill and the area was covered with two feet of compacted fill. At the same time, a 1000 foot long impervious, clay dike was placed along the Bay front. Both the earthen dike and the soil cap have mostly eroded away and signs of them are no longer visible.

WASTE SANDBLAST GRIT STABILIZATION AND REMOVAL ACTION

The activities conducted by Triple A Machine Shop during their lease of the Shipyard generated waste sandblasting grit (also called abrasive blast material, or ABM, in cleanup documents). The Navy also generated waste sandblasting grit in their ship-cleaning operations. Sandblast grit is used to clean and remove paint from equipment, vehicles, aircraft, ships and other parts. There are many types, most of which are derived from slag from smelting operations. For this reason, sandblast

grit typically contains heavy metals such as lead, nickel, chromium, and copper. The paint chips that were removed via the sandblasting are another source of contamination in waste sandblast grit.

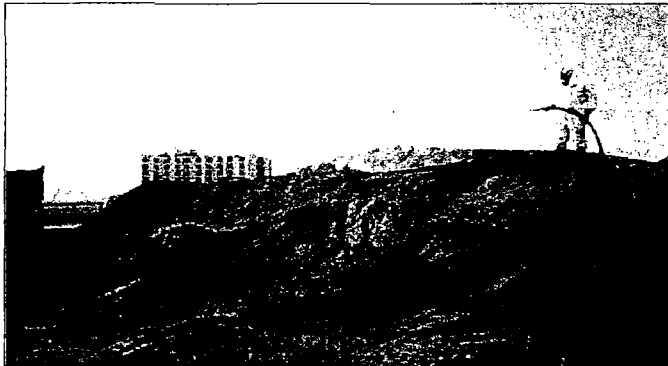


Photo source: Technology Transfer Report on Recycling Spent Sandblast Grit into Asphaltic Concrete

A view of the waste sandblast grit pile on Parcel E landfill before removal

The waste sandblasting grit produced by Triple A was disposed of in and near the Landfill area, resulting in a 4000 cubic yard pile of sandblast grit on a cleared soil area of the Landfill. It is unclear whether or not waste sandblast grit produced by the Navy contributed to this pile. The pile was approximately 20 yards (18 m) wide, 45 yards (41 m) long, and about 9 feet (3 m) high with a relatively flat top. To reduce dust emissions and water infiltration, it was covered with a tarp. During a stabilization test in 1989, high levels of lead and copper were detected in the sandblast grit but no asbestos was found. Monitoring for radioactivity was also conducted and no activity was noted.

A study conducted in 1995 concluded that it was possible to recycle the waste sandblast grit into asphalt. The Navy hired a local trucking firm to transfer the waste sandblast grit from Parcel E to Orland Asphalt in Orland, California for a recycling project. There are no more piles of waste sandblast grit remaining on the surface of the Landfill; however the soil where the pile was located still shows signs of the sandblast grit.

SHEET PILE WALL

Further steps were taken in 1997 to reduce the flow of contamination into the Bay when a groundwater plume within the Landfill was identified as possibly moving towards the Bay. The main chemicals of concern within the groundwater plume were PCBs, though volatile and semi-volatile organic compounds and petroleum hydrocarbons were also present. To reduce the potential for these contaminants to reach the Bay, a sheet pile wall was installed.

Sheet pile are thick, interlocking steel plates. The sheets were driven into the ground until they reached a natural layer of clay, forming an underground wall between the landfill and the Bay. The wall built at the edge of Parcel E is 614 feet in length and reaches between 12 and 55 feet below ground surface, depending on the depth to the Bay Mud. It does not extend along the entire Landfill shoreline. The intended purpose of the sheet pile wall is to create a relatively impermeable vertical barrier to groundwater flow.

By creating a barrier, the groundwater no longer flows into the Bay but rather builds up behind the wall. To prevent excessive build up of groundwater on the Landfill side of the sheet pile barrier, a groundwater extraction system was installed between December 1997 and May 1998. The system is made of a series of pumps and pipes that transport the groundwater away from the wall into a sanitary sewer line. This system is still in place and running to date.

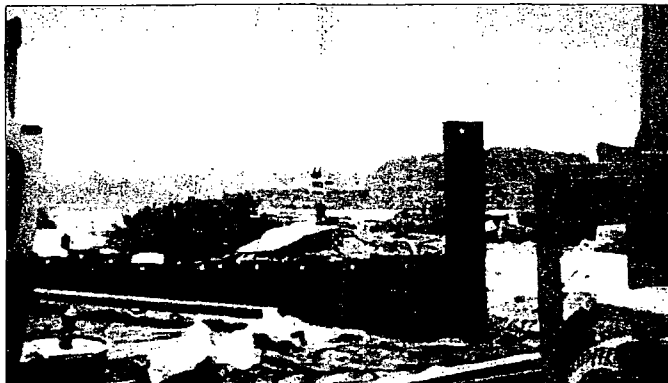


Photo source: Site IR 1/21 Industrial Landfill Groundwater Extraction System/Containment Barrier Post-Construction Report

Installation of the sheet pile wall to prevent groundwater contamination from reaching the Bay

The Navy claims that the water coming out of the extraction system is clean enough to be discharged, untreated, into the sanitary sewer system. Indeed, the results from the latest sampling of the water being extracted (May 2003) show that all detected contaminants were below permit requirements. You may be wondering: if the purpose of the wall was to block contaminated groundwater from entering the Bay, how is it that the water being pumped is clean enough to be discharged to the sewer system? Unfortunately, now that a barrier has been created, even if the groundwater that is building up at the wall is not contaminated, the Navy must continue pumping the groundwater if they do not want the water to build up and create a lake.

The total amount spent to date on this system is un-

known. Approximately \$965,000 was spent to install the sheet pile wall and groundwater extraction system, including three years of post-installation maintenance. The maintenance of the groundwater extraction system costs about a quarter of a million dollars annually.

LANDFILL CAP

In August 2000, a fire occurred in the surface and sub-surface of the Landfill. Although the Navy learned of the Landfill fire on August 16, neither the regulators nor people living in nearby neighborhoods were notified until August 31. The U.S. EPA fined the Navy \$25,000 for the Navy's two week delay in notifying the regulators and the community.



Photo source: Arc Ecology

Removal of shrubs in an attempt to extinguish landfill fire before installation of landfill cap

Over a period of two days approximately 600,000 gallons of water were sprayed on the Landfill in an attempt to extinguish the fire. Once the surface fire was extinguished, parts of the Landfill continued to smolder. After several unsuccessful attempts by the Federal Fire Department to put out the remaining fires with water, it was determined that the fires were underground and would have to be smothered. The Navy decided to install a 16-acre multi-layer cover (cap). The intention of the cap was to deplete the Landfill of oxygen, to ensure that the underground fires were smothered and to prevent future fires. Thus, the cap was installed primarily over smoldering portions of the waste and does not cover the entire spatial area of the Landfill. Cap installation began on September 13, 2000 and was completed on March 31, 2001. Approximately 10 million dollars were spent on the installation of the 13 acre landfill cap.

The major components of the landfill cap are the foundation layer, a geosynthetic cover system, and a vegetated soil cover.

- **The foundation layer** is made up of at least two feet thick, well-compacted soils. The purpose of the initial layer is to provide adequate strength to support the loads associated with the cover system and maintain the integrity of the cover during and after an earthquake. It also works to prevent failure of the cap during settlement while providing the appropriate grades for drainage control.

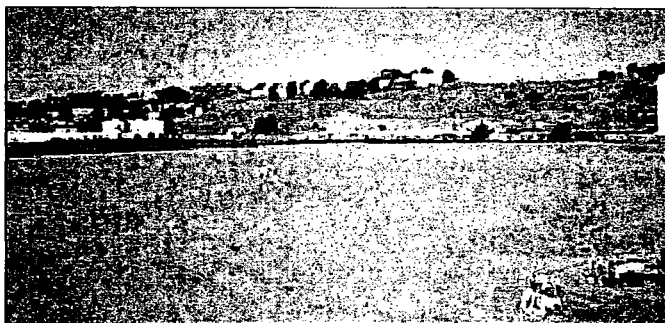


Photo source: Removal Action Landfill Cap Close-out Report

View of the foundation layer of the Parcel E landfill cap

- **The cover system** is designed to meet state and federal requirements. It consists of a geosynthetic clay liner, a high-density polyethylene liner and drainage net, and a geotextile filter fabric.



Photo source: Removal Action Landfill Cap Close-out Report

The polyethylene liner is one of several layers used in the cover system of the landfill cap

- **The vegetated soil cover** is the final layer and consists of clean soils that support the vegetation that were

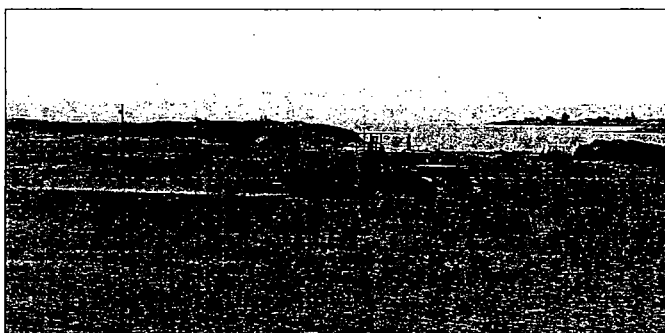


Photo source: Final Weekly Project Update Parcel E Landfill Cap

Watering the soil cover to promote vegetation growth

seeded over the area. The species chosen for the area are shallow-rooted to limit root penetration into the cap while allowing drainage and preventing erosion.

After being notified of the landfill fire, the EPA immediately directed the Navy to install air monitors around the Landfill. Six ambient air-monitoring stations were established along the perimeter of Parcel E on September 8, 2000. Air monitoring was performed daily to determine if hazardous levels of contaminants resulting from the landfill fire or the capping activities were in the air around the Landfill. Monitoring continued until the landfill cap was completed. All of the air monitoring data can still be found on the Navy's website along with cap construction updates and other information about cap installation. (www.efdsww.navfac.navy.mil/06/HPS_E/index_HPS_E.htm)

It is important to remember that the installation of the landfill cap was considered an interim measure and there have been no final cleanup decisions made about the Landfill. Maintenance of the landfill cap continues today. For example, the Navy recently signed a contract to seed and mow the area to continue with erosion prevention measures.

LANDFILL GAS AND THE CURRENT REMOVAL ACTION

It is common in a Landfill, or in any environment where there is decomposition of organic matter, for methane gas to be produced. The same is true of the Landfill at Parcel E. While methane gas (a.k.a, natural gas) is not toxic, it is explosive at low concentrations. At a concentration of between 5 and 15% methane in air, methane becomes an explosive hazard. Five percent or 50,000 parts per million (ppm) is defined as the lower explosive limit (LEL). Methane gas also can cause asphyxiation in a confined space. Escaping methane can become a carrier for other toxic landfill gases that are trapped below the surface.

Before the landfill cap, methane gas was most likely venting over the entire surface of the Landfill. This changed when the landfill cap was installed. Similar to steam from a pot of boiling water that continues to force its way out along the edge of the pot when covered with a lid, the methane gas was forced to find other escape routes once the cap was installed: along the edge of the Landfill. Per a request from the State EPA's Department of Toxic Substances Control, the Navy began monitoring for methane gas.

The Navy's landfill gas investigation detected landfill gas within wells and vaults located on or close to the

For more details about what prompted the Navy to begin testing for methane gas, see the SF Weekly article "Massing Gas" at www.sfweekly.com/issues/2002-01-02/bayview.html/1/index/html

Landfill in Spring 2002. Landfill gas was not detected in the breathing zone at any on- or off-site locations but was detected in the crawlspace of Building 830 and at the ground surface at four outdoor locations adjacent to the utility trench that runs along the fence-line in the western corner of the UCSF property. Below ground, methane and other landfill gases were detected near the Parcel E Industrial Landfill. In general, concentrations were higher along the northern side of the Landfill, the highest point, which is where methane tends to migrate in a landfill. Methane concentrations decreased with distance from the Landfill along the eastern, southern, and western sides of the landfill and no methane was detected north of Crisp Avenue.

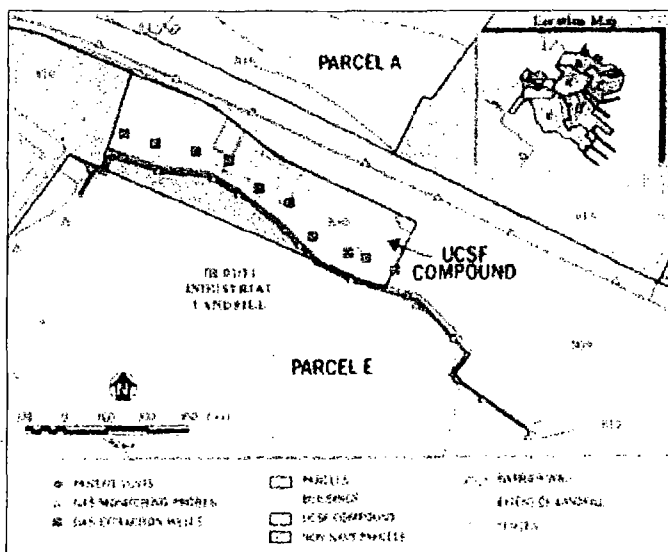


Figure shows location of barrier wall and extraction wells

Based on these results, the Navy decided to conduct a removal action to reduce the levels of methane gas from the subsoil within the UCSF compound to below 5% methane in air (the lower explosive limit) and to prevent future migration of methane gas from Parcel E into the adjacent UCSF compound. With the help of the community, the Navy devised and implemented a system to meet these goals. There are two main components to the system: a barrier wall and gas vent trench and a gas extraction system.

•The barrier wall and gas vent trench are approximately 1475 feet long and are located along the northern

border of the Landfill at the outermost limits of the waste but not within the waste fill. The landfill gas that is migrating northward will collect in the gas collection trench and will be prevented from off-site migration by the barrier wall. Once collected in the trench, there are four passive vents with treatment filters through which collected gas will travel. The job of the filters is to remove all organic compounds (e.g., vinyl chloride) with

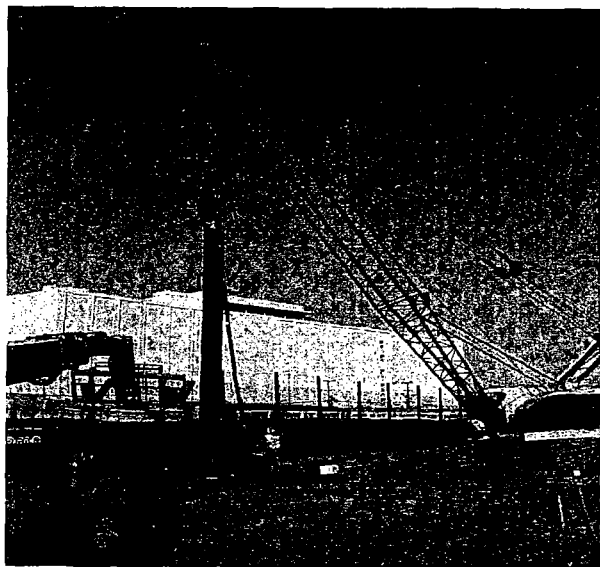


Photo source: US Navy, Southwest Division, EFD SW

Installation of the barrier wall along the northern border of the landfill to prevent off-site migration of landfill gases

the exception of methane. The methane is vented to the atmosphere 15 feet above ground surface. Passive venting will continue until the final remedy for Parcel E is in place. The treatment filters will also remain in place unless future monitoring shows that the concentrations of non-methane organic compounds that are escaping from the vents no longer pose a threat.

•**The gas extraction system** is located outside of the Landfill area, north of the barrier wall. It consists of 10 gas extraction wells and 2 mobile gas extraction units with vacuum blowers and treatment units. The treatment units are the same as those used on the passive vents and serve the same purpose. The only difference with the active system is that a vacuum blower is used to help extract the landfill gas at a faster rate. Only 2 of the 10 wells are attached to a treatment unit at any one time. According to the Navy's work plan, each unit will remain at a single well for 1-2 weeks. It is anticipated that a minimum of 2 complete cycles through all of the wells is necessary in order to achieve the clean up goal within the UCSF compound. The active system is expected to run for about six months.

A monitoring schedule has been established by the Navy



Photo source: Tetra Tech, EMI

Inspecting a passive gas treatment system. The organic compounds are treated as they pass through the treatment filters.

to ensure that the treatment units are in fact treating the landfill gas. If a breakthrough occurs within the treatment units, the system will be shut down and the filters will be replaced. Wells along the perimeter of the Landfill continue to be monitored to catch any changes in the pattern of the landfill gas flow. Meteorological data like wind patterns, temperature, precipitation and relative humidity are also being gathered on a daily basis from a meteorological station that the Navy has set up on the Landfill.

At this point, the Navy has completed 3 of the 4 months of monitoring and methane remains below levels of concern on the UCSF property. Weekly updates on the landfill gas control system are posted on the Navy's website. For an up-to-date report on the gases being extracted from the system, the levels of methane at each of the wells, or meteorological data, visit www.efds.w.navy.mil/06/indexHP.htm

WHAT NEXT?

With all of the interim cleanup actions that have taken place on the Parcel E Landfill, it can be difficult to keep track of where Parcel E is in the cleanup process. It is important to remember that all measures taken thus far were considered interim actions taken to protect human health and the environment from immediate danger posed by the contamination at the Landfill. **No final clean-up decisions have been made about the Landfill.**

A Remedial Investigation (RI) was completed in October 1997, which worked to characterize the nature and extent of the contamination on Parcel E. The Draft Parcel E Feasibility Study (FS) was then submitted in January 1998. During preparation of these reports, the Navy

SUMMARY -

Removal actions taken to date in chronological order, since the Navy stopped using the Parcel E Landfill:

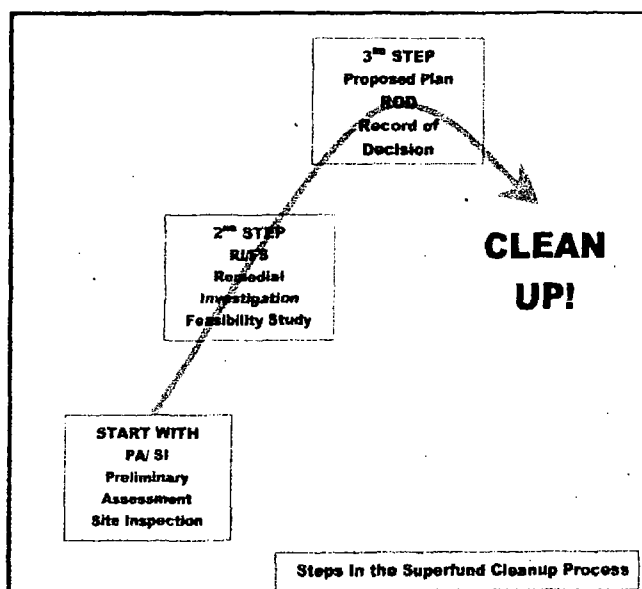
- 1974-1975: Addition of 2 ft soil cap and creation of a 1000 ft long earthen dike along the Bay front
- 1995: Transfer of waste sandblast grit pile to Orland Asphalt for recycling project
- 1997: Installation of 614 ft long sheet pile wall & groundwater extraction system
- 2000-2001: Installation of interim landfill cap to extinguish landfill fire and prevent further fires
- Present: Landfill gas removal action to prevent off-site migration of landfill gases and to reduce concentrations of hazardous gases escaping from landfill

and regulatory agencies identified additional data required to successfully choose an appropriate remedial action. A data gaps investigation is currently being conducted to complete these tasks. The information required includes the following activities:

1. Delineation of the lateral extent of waste fill for the industrial landfill area
2. Characterization of industrial landfill gas and delineation of its lateral extent
3. Evaluation of the potential for liquefaction in subsurface soils in areas surrounding the Industrial Landfill
4. Performing a wetlands delineation, and values and functions study

Once the data gaps investigation is completed, a Revised Remedial Investigation/Feasibility Study will be issued. The initial draft version is scheduled to come out in April 2005. The Navy allows the public to informally review the RI and FS documents.

When the Revised RI/FS has been reviewed and agreed upon by the regulatory agencies, the Navy will issue a **Proposed Plan**, which will outline their preferred method of remediation. A statutory 30-day comment period will go into effect once the Proposed plan has been submitted. The statutory 30-day comment period must be extended by a minimum of 30 additional days if the community requests an extension. This is the most important opportunity for community input. Any comments received by the Navy during the comment period will be entered into the Administrative Record and the Navy is required to respond to all comments received. The Proposed Plan for Parcel E will be issued in November 2005, according to the schedule. (Though the schedule is subject to change.)



After taking into consideration and responding to all of the comments received on the Proposed Plan, a **Record of Decision** will be written explaining which remedial alternatives will be used at the site.



Photo source: Arc Ecology

Parcel E Landfill, as it is today, looking south toward Candlestick Park.

GET INVOLVED!

Are you concerned about the effect of the Shipyard on your community? Would you like to have a say in the decisions that are being made regarding the cleanup? There are a number of ways you can get involved. For more information:

Stop by the Community Window on the Shipyard:

4634 Third Street, San Francisco

Contact: Lea Loizos or Cian Dawson, Arc Ecology Staff Scientists
(415) 643-1190 or (877) 946-3698 (877-WINDOW-8)

Email: lealoizos@mindspring.com or Cian_Dawson@mindspring.com

Visit our website! <http://www.communitywindowontheshipyard.org>

- OR -

Arc Ecology

833 Market Street

Contact: Lea Loizos, Staff Scientist, (415) 495-1786 or email: lealoizos@mindspring.com

Hunters Point Shipyard Restoration Advisory Board

Meets the third Thursday of the month at Dago Mary's (at the Shipyard gate)

Contact: Lynn Brown, Community Co-Chair, (415) 285-4628 or email: l_brown123@hotmail.com

Citizens Advisory Committee to the Mayor

Meets monthly at the Southeast Facility, 1800 Oakdale Avenue

For meeting dates and times call (415) 822-4622 or email ccomp64169@aol.com

Community First Coalition

Meets every Friday at 2:30 at the Anna Waden Library, 5075 Third Street

Contact: Maurice Campbell, at mecsoft@pacbell.net

This booklet was created as part of the **Community Window on the Shipyard**, a joint project of Arc Ecology, the Bayview Hunters Point Community Advocates and the San Francisco Department of the Environment. The Community Window was created to improve Bayview Hunters Point Community participation in the decision-making around the cleanup of the Shipyard by providing a clearinghouse for information, regular community briefings on the status of the cleanup and access to technical experts and resources to help explain the cleanup process.

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18. Time-Critical Landfill Gas Removal Action Work Plan, Attachment C (Extraction, Monitoring, and Maintenance Plan,) October 2002
19. Update on Parcel E Landfill Gas Removal Action Fact Sheet, August 2002